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INSTRUCTIONS

RELATIVE TO THE

ETHNOLOGY AND PHILOLOGY OF AMERICA.

APPENDIX A.

PHYSICAL CHARACTER OF THE INDIAN RACES.

INVESTIGATIONS are now being made into the physical character of the soldiers composing the armies of the United States, embracing a large number of measurements of different parts of the body, designed to ascertain the effect of climate, locality, and mode of life upon men, the average size and proportions of troops of the United States as compared with those of foreign countries, and those of the different States as compared with each other.

In connection with this inquiry it is deemed a matter of interest to extend the examination to the Indian tribes of America, and to ascertain the proportions of the aboriginal races as compared with those of European descent, and also the effects of different food, climate, and mode of life upon the various tribes of the former.

The measurements selected for this purpose are, for various reasons, limited to a smaller number than in the case of the army, and with the exception of that of weight, which as being variable is of the least consequence, are such as can be taken with a tape-measure. They should be made with great care in feet, inches, and tenths of an inch.

Persons familiar with the Indians are aware that a great difference exists in the complexion, not merely of individuals, but of tribes. In some cases that peculiar reddish tinge of the skin which has given to the race the name of "Red" or "Copper-colored Men" is predominant and marked; in others a light brown is the more common; again, a yellowish or somewhat orange hue exhibits itself; and, finally, some approach nearly to black. Among the lighter colored the red often shows in the cheek. Nor are these diversities due altogether to climate or exposure. There seem to be well authenticated instances in which food also influences complexion. Thus it is said that among the Chepewyan tribes of British America, the Cariboo or Reindeer eaters are much darker than the cognate tribes who live on fish, and this, too, although they inhabit a far northern latitude. The texture of the skin is a noticeable feature. That of the younger Indians, where it can be perceived through the dirt, is usually exceedingly soft and delicate, but becomes wrinkled with middle age. An important difference in the color of the hair also occasionally shows itself. For instance, the Indians of the Nooksahk tribe, in the neighborhood of Mount Baker, Washington Territory, have often light-brown and even flaxen hair in youth, which, however, grows dark with age, and yet their blood is unmixed. When neglected and exposed to the sun the hair becomes of a rusty hue, and like that of whites loses its gloss. Among some of the Pueblo tribes of New Mexico albinos are not uncommon. Hazel eyes are frequent among the Indians of the lower Klamath.

Particular information should be given as to their food, whether consisting of game, fish, maize, roots, &c., and even as to the kinds of either, whether of buffalo, elk, deer, or cariboo, of salmon or other varieties of river fish, or of the various animal productions of the sea, such as the whale, walrus, seals, &c., as among the Esquimaux and some of the Northwest Coast Indians.

Their mode of life will, of course, influence the development of the form. Among the tribes who live almost altogether on horseback, or in canoes, we may expect to see the legs comparatively small, while in the latter the arms will be proportionately large. Among the mountain tribes, on the other hand, the legs will be more muscular and the chest expanded. As a general rule their limbs are rounded, and the separate muscles are not developed as in the white and black races. As to this, observations are requested.

The age of Indians it is very difficult, in most cases impossible, to ascertain, as they keep no record even in memory. An estimate founded on careful observation will, however, afford a reasonable approximation. Sometimes a reference to a known event as having occurred when they were of the size of some young boy will afford a guide. As the men usually marry young, the age of their families furnishes often another. A great age, notwithstanding apparent decrepitude, is very rarely attained, especially by the male sex.

In the case of mixed breeds it is by all means desirable to ascertain and state whether either one or both parents were themselves mixed, and, if so, to what degree. Any observations on the comparative physical development, health, and length of life among the mixed breeds will be very gladly received.

Where the inquiry is made by medical men, other points will naturally suggest themselves. Among them, it will be well to ascertain the number of regular pulsations and respirations per minute.

It is hardly necessary to add that these measurements should be confined to adult males. Observations on boys who have not attained their growth would have no value.

PARTICULARS OF INQUIRY.

In order to avoid the necessity of transcribing the questions, references may be made to the numbers and letters. Separate tables in quarto have been prepared, and will be furnished on application to the Smithsonian Institution.

1. Name of Indian.
2. Name of tribe.
3. If of mixed blood, in what proportion?
4. Country occupied by tribe.
5. Mode of subsistence, whether by hunting, fishing, &c. Habits, whether used to riding, foot, or canoe travel.
6. Articles of usual food.
7. Age (by estimation) between 20 and 30, 30 and 40, &c.
8. State of general health.
9. Weight in lbs. and half lbs.
10. General complexion, whether reddish, brown, yellowish, or black.

11. Hair, color of.

12. Eyes, color of.
    - *a.* Whether oblique or not.
    - *b.* Distance between outer angles over root of nose.

13. Teeth.
    - *a.* How many are lost?
    - *b.* Are they much ground down by hard food?
    - *c.* Do the opposing incisor teeth of the two jaws rest on each other, do they overlap?

14. Entire height without shoes.

15. Head.
    - *a.* Largest circumference around.
    - *b.* Distance between orifices of ears over top of head.
    - *c.* Distance from root of nose over top of the head to base of skull.

16. Arm.
    - *a.* Length outside from point of shoulder cap to tip of middle finger.
    - *b.* Length from same to point of elbow when bent.
    - *c.* Length from point of elbow to lower end of ulna.
    - *d.* Length from lower end of ulna to tip of middle finger.
    - *e* Largest girth of arm.
    - *f.* Largest girth of forearm.
    - *g.* Largest girth of hand.
17. Distance from upper centre of breast bone to end of middle finger, arm extended.
18. Breadth of shoulders behind.
19. Girth of neck.

20. Girth of chest around nipples.
    - *a.* With full inspiration.
    - *b.* After expiration.
21. Girth of waist.
22. Girth around hips on level with the head of the thigh bones.
23. Leg.
    - *a.* Height from ground to top of hip-bone, outside.
    - *b.* Height to knee-joint outside.
    - *c.* Height to crotch inside.
    - *d.* Largest girth of thigh.
    - *e.* Largest girth of leg.
24. Foot.
    - *a.* Length from tip of great toe to extremity of heel.
    - *b.* Girth of instep.
    - *c.* Girth around heel and instep.

INSTRUCTIONS

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APPENDIX B.

NUMERAL SYSTEMS.

In the original circular of "Instructions" allusion was made to the fact that some of the Indian tribes use different sets of numerals, or rather modifications of the numerals, as applied to different objects. This fact, in connection with the various serial systems upon which their enumeration is based, presents a subject worthy of particular inquiry, the more especially as the same singularity exists among other distant and distinct barbarous nations.

Mr. Gallatin in his "Notes on the Semi-Civilized Nations of Mexico," &c., published in the Transactions of the American Ethnological Society (vol. ii. p. 54, et seq.), says: "Another peculiarity of the Mexican and Maya, and of which traces may be seen in other languages of the same group, is the alteration which the numerals undergo according to the nature of the object to be counted. The distinctions are not always easy to be understood; and the objects of the same class, that is to say in counting which the same altered numeral is used, are apparently of the same incongruous nature. Those stated by Father Alonzo de Molina for the Mexican language, are as follows:—

1	ce, cem	6	chica-ce
2	ome	7	chic-ome
3	yey	8	chic-uey
4	naui	9	chicu-naui
5	macuilli	10	mat-lactli

20 cem-poualli"

I have excerpted only the first ten numerals and the word for twenty from Mr. Gallatin's Table *A*. He proceeds:—

"The numerals as laid down in Table *A*. are used in counting animated beings, mantas, mats, paper, tortillas, ropes, skins, canoes, cycles, knives, and candles; but in counting several of these, the word *pilli* and sometimes *quimilli*, is substituted for *poualli* (20).

"The syllable *tetl* is added to the numerals, and these lose their last syllable (*matlactetl* for *matlacti*, *cem-poualtetl* for *cem-poualli*) when counting fowls, eggs, cocoa, jars, frijoles, fruits, roots, rolls, or round things.

"The word *pantli* is added to the numeral when speaking of ridges made by the plough, of walls, files of men, and of other things arranged in length.

"*Tlementli* is added to the numeral when speaking of speeches, dishes, bags, shields, or when a thing is doubled above another, or when speaking of things differing one from the other."

No reference to such a system is to be found in the Grammatical sketch of the Heve, translated by Mr. Buckingham Smith (No. III of Shea's Linguistics); in the Nevome Grammar (ibid. No. V), the mutsun of Father Arroyo (ib. No. IV), or Father Sitjars vocabulary of the San Antonio (ib. No. VII), the only extended works at present accessible on the languages of Sonora and California, but it is very possible that it may exist there and have escaped notice.

In Father Pandosy's Grammar of the Yakama, a Sahaptin language of Washington Territory (Shea's Linguistics, No. V), the numerals are not specially referred to; but in the accompanying dictionary *metat* is given for three, *metao*, three persons; *pinept* for four, *pinapo* four persons; *parat* five, *par-nao*, five persons, and other numerals are given in duplicate or triplicate without explanation.

Father Mengarini, in his Grammar of the Selish, or Flathead of the Rocky Mountains (Shea, No. II.), says of the cardinal numbers, "they are duplex, one set relating to things, the other to persons, thus:—"

	Relating to things.	*Relating to persons.*
1	nko	schnaksi
2	esèl	chesèl
3	chèlès	ch'chèlès
4	mús	ch'músms
5	zil	ch'zilzil
6	tàckan	ch'tackan
7	sispel	ch'sispel
8	hèhènem	ch'hèhènem
9	ganút	ch'ganut
10	open	ch'open

Similar changes exist in other dialects of the Selish, of which the following from the Nisqually will serve as an instance:—

	Applied to men.	*Applied to money.*
1	dut-cho	che-élts
2	sale	sla-élts
3	klekhw	kle-hwélts
4	bōs	bōs-élts
5	tsa-lats	tslat-sélts
6	dze-lá-chi	dzlatch-élts
7	tsōks	tsok-sélts
8	t'ká-chi	t'ka-chi-élts
9	hwul	hw*u*l-élts
10	pa-d*u*ts	pa-dats-élts
20	sa-lá-chi	

Zeisberger in his "Grammar of the Language of the Lenni-Lenape, or Delaware Indians" (Trans. Am. Phil. Soc., N. S., vol. iii), gives the list of numerals, without stating its application, as follows:—

1	ngutti
2	nischa
3	nacha
4	newo
5	palenach
6	guttasch
7	nischasch
8	chasch
9	peschkouk
10	tellen

And then adds the following, used in respect to inanimate objects, as towns, rivers, houses, &c.

Mawat, ngutti, one, only one, and in the plural, *nischenol,* two, *nachenol,* three, &c., concerning which he observes, "When men, animals, or other things are spoken of, which among the

Indians are considered as belonging to the animated class of beings, they say: *mauchsa*, *mayauchsu*, one person, or a person, or living being. It is truly incorrect to say *ngutti lenno*, a man. And in the plural, *nischowak lennowak*, two men, &c.

All and *ak*, the terminations of these last in the plural, are respectively applied, the former to inanimate, the latter to animate objects. But as exceptions, it is stated that among nouns, trees and the larger plants are considered animate, while fishes take the inanimate termination. It is thus evident that a similar idea has governed the form of the numeral adjective in the Delaware and the Mexican.

Other examples among the North American languages might be cited, but the above are sufficient to indicate the object of inquiry. The system appears, however, not to have been universal, as, according to Dr. Wilson, there is no distinction of numerals in the Seneca or other Iroquois languages.

Singularly enough, the same idea prevails in the numerals of other and far distant races, of which a few specimens may be useful.

The Hon. John Pickering, in "Memoirs of the American Academy," N. S., vol. ii, gives an account of the language and inhabitants of Tobi, or Lord North's Island, in the Indian Archipelago, derived from an American seaman, Horace Holden, who spent two years upon it. This island is situated about lat. 3° 2′ north and lon. 131° 4′ east, and is of very small extent and sparsely inhabited. The different forms of the digits are thus given in the accompanying vocabulary:—

	General cardinals.	*For cocoanuts.*	*For fish.*
1	yat	su	simŭl
2	guh-lu	guó	gwimŭl
3	ya	sarú	srimŭl
4	van	vao	vamŭl
5	ni	limó	nimŭl
6	wŏr	waru	wawrimŭl
7	vish	vishu	vishi-emŭl
8	wawr	tiu (?)	wawrimul
9	tiú	(wanting)	tuimul
10	se *or* sek	sek	sek

He adds, however, that in counting out fish, they proceed by pairs or couples, as, two, four, six, &c.

In counting *fish hooks*, they use still a different set of numerals, which were not recollected. It would appear further that stones, birds, and days were counted by the same numerals as cocoanuts, and men and women by those employed to enumerate fish.

Mr. Hale, in the "Ethnography, &c., of the U. S. Exploring Expedition," copies Holden's vocabulary, which is also appended to a narrative of his captivity, published at Boston.

Dr. L. H. Gulick, in his notes on the Grammar of the Ponape dialect (12mo. Honolulu, 1858, pp. 39), states that "the enumeration of all objects is alike as far as *nine*, after which there is a singular variety." The difference is in—

"I. The mode of counting all animated objects, and all kinds of sticks and timbers, and everything that to a native is connected in idea with separate sticks, as trees, canoes, &c.

"II. The enumeration of yams, taro, and a few of the most costly articles.

"III. The numbering of cocoanuts, bread-fruits, eggs, shells, stones, &c., in fact, probably, of all common, least valued objects, not included under the first head."

Examples are given, not necessary to repeat here, as also of peculiarities in the numerative particles.

The Island of Ponape, Paanopa, or, as written by Mr. Hale, Bonabe, is one of the central islands of Micronesia. That gentleman gives also a vocabulary of the language of Taputeoua, in the Kingsmill group, one of the most eastern, and separated from Tobi by 2600 miles. Speaking of the numerals, he says that the natives furnished the expedition with several sets or classes, which he conjectured were used in counting objects of different kinds, though he had no means of obtaining from them any explanation. There were five of them in all, and all given in the digits, or from one to ten.—Eth. of Ex. Exp. p. 440.

Leaving Micronesia for Polynesia, Mr. Hale states that some of the terms for the higher numbers are only used in counting particular articles. For *four*, the Hawaiians, for instance, have two terms, *ha* and *tauna*. For forty, they have *tanahá*, *iato*, and *ta'au*. The first of these, *tanahá*, is the general term; *iato* is used in counting pieces of *tapa* (native cloth), and *ta'au* in counting fish. (Ib. p. 250.)

It is remarkable that thus, in Tobi and Taputeoua, the distinction should extend to all the digits; and in Ponape, which is between the two, and Hawaii, distant 3500 miles, it should be confined to the higher numbers.

The last example here presented is from Bowen's Yoruba Dictionary, in the 10th vol. Smithsonian Contributions. In this, an African Language, traces of the same system also appear. Thus in ordinary counting the first vowel is short, while among what the author terms "cardinals of price," up to forty, the vowel is long; thus *okay*, one, *edzì*, two; *ōkay*, *ēdzì*. The reason given for this is that the latter are contractions of *owó-kay*, *owó-edzì*, i. e. one cowrie, two cowries, &c.

It thus appears that this peculiar arithmetic is of wide distribution, and by no means confined to a single or even to cognate races. A more perfect knowledge of barbarian languages would probably show its still greater extension. In what process of the human mind it has its origin, and the reasons for the singular collocation of objects which different tribes embrace in the several forms of the numerals, are questions of curious speculation.

The division of objects into animate and inanimate, or, as they have been termed by other writers, noble and ignoble, is a well-known feature in several of the languages of North America. Mr. Howse states that the Cree and Chippeway (Ojibwa) nouns are divisible into two classes, animate and inanimate, analogous to gender in European languages, but that many inanimate nouns, from possessing some real or imaginary excellence, are personified as animates. Perhaps a clue to this may be found in the pantheism, or rather pan-demonism of the Indian mythology. The Indians of Oregon, for example, believe that not only all animals were once people possessed of supernatural powers, or magicians, but that prominent mountains, isolated rocks, very old trees, and other remarkable objects, were so likewise, a belief which, in fact, seems to have characterized the superstitions of all the tribes of the continent. But, though this might account for a simple division into animate and inanimate, embracing all such objects, it would not explain the multiplicity of forms exhibited in some of the examples above given. The disposition to particularize, and the want of generic terms among barbarous races, may have had some connection with this division, for since to adopt a different system of counting every object would be impossible, the simple desire to be specific may have led to an anomalous form of classification.

The second object in this investigation is to ascertain the series of numbers upon which enumeration is based among different tribes. The most natural, and, among barbarous nations, most common, is the quinary system, or that by fives, corresponding with the fingers of one hand. In this the first five digits are simple, that is to say, are all different; the second form compounds or modifications of these first, as will be seen by referring back to the example given of the Mexican. In many cases, however, it has happened that, in the lapse of time, new words have been adopted for a portion, while the old have become obsolete, or appear only occasionally in combination. In a number of vocabularies examined, it would appear that the numbers 7 and 8 most frequently retain the compound form, and 10 has oftenest changed. The 7 and 8 usually contain the elements of the words 2 and 3, as representing the 2d and 3d fingers on the second hand. Nine is frequently "one less than ten."

Probably in almost all these languages the quinary system was the oldest, and the decimal, where it now exists, has been of subsequent introduction, or rather growth. In the Chinook, for example, the names of the digits are all simple with the exception of that for seven. Thus *makst* two, *sini-makst* seven, *sini* being, perhaps, an obsolete form of five. These obsolete forms are sometimes revealed in the numeral ten and its compounds and multiples. Thus the simple digit ten may have one name, while in eleven=10+1, or twenty=2×10, the word will be entirely different. In the Napa, of California, *hopen* signifies two, and *ma-ha-ish* ten, but twenty is *hopi-hol*, the other multiples retaining the syllable *hol* up to one hundred, which is *ma-ha-ish sol*, the *h* being changed to *s* for euphony.

Twenty is, in some languages, a translation of *two tens*, in others a distinct word exists, and this is in many the name for head, body, or person, as in the Opata, *seis dosme* (literally one person), signifying, of course, all the fingers and toes of one person. In the Nisqually the word for twenty, s'ha-lat-chi, means literally the fingers and toes. As to the other multiples of ten, they are usually expressed by the literal translation of 3×10, 4×10, &c. But in the Opata and kindred dialects this form occurs, 20, *seis dosme;* 30, *seis dosme macoi tarewa*, i. e. ten more than one person; 40, *wodun dosme*, or two twenties; 50, *wodun dosme macoi tarewa;* 60, *beidum dosme,* three twenties, &c.

A good many anomalous forms occur, unnecessary to repeat here, as, for instance, 2 × 4 for 8, 2 × 3 for six.

Besides the quinary and decimal series, the binary and vigintesimal are supposed to be represented.

A sufficient number of extended vocabularies of numerals have not been obtained to admit of a thorough examination and comparison of the different series in use, and the following table has, therefore, been prepared, which will enable the collector to combine both subjects of inquiry in one, the figures having been selected in reference to the latter, and the arrangement in parallel columns to the former. These are headed "Simple Cardinals," "Personal Cardinals," and "Cardinals of Value," merely as a guide, and not as indicating that they will in all cases convey the true idea. It is desired that as careful inquiry as possible should be made into the facts in each one, and that the objects included in the separate classes be enumerated. It is probable that in some languages other columns must be added.

Very few tribes, it will be found, count beyond 100, while some of the more ignorant have no numbers beyond five. It is desirable in all cases, if possible, to ascertain the meaning of the larger collective numbers, as 10, 20, and 100, and another point of inquiry may be the names of the different fingers, especially of the thumb, thus:—

Little finger.
Ring finger.
Middle finger
Fore-finger.
Thumb.

TABLE OF NUMERALS.

	Simple cardinals.	Personal cardinals.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

TABLE OF NUMERALS.

	Cardinals of value.	Other cardinals.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

TABLE OF NUMERALS.

	Simple cardinals.	Personal cardinals.
30		
40		
50		
60		
70		
80		
90		
100		

TABLE OF NUMERALS.

	Cardinals of value.	Other cardinals.
30		
40		
50		
60		
70		
80		
90		
100		

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